REMARKS

Pending Claims

Claims 1-20 were presented for examination and are pending.

Claims 1-14 were allowed in the Office action from March 9, 2005. Claims 15-20 were rejected.

The applicant respectfully traverses the rejection and requests reconsideration in the light of the following remarks.

Claim Rejection 35 USC 103(a)

Claims 15-20 were rejected under 35 U.S.C. 103(a) as being unpatentable over Adair, Jr. U.S. Patent 5,659,303 in view of Kent U.S. Patent 5,222,142.

The applicant respectfully traverses the rejection.

The applicant respectfully submits that the amended claims claim fundamentally different invention from Adair and Kent alone or in combination and that Adair alone or in combination with Kent invention in no way makes the presently claimed invention obvious.

Claim 15 recites:

> 15. (Previously Presented) A frequency hopping telemetry transmitter comprising:
>
> circuit for transmitting transmissions intermittently, at time intervals and at various frequencies, independently of any receiver of said transmissions, and
>
> ***logic for providing a predetermined frequency-time pattern for controlling transmission frequency and time between transmissions***, and
>
> wherein said transmitter is for ***varying encryption***, for said transmissions, ***based, at lest in part, on said frequency-time pattern***.
>
> ***(emphasis added)***

Claim 15 reflects the transmitter ability according to the present invention to operate in a one-way only system where transmitters communicate short intermittent messages over varied frequencies to a receiver without a benefit of a reverse communication link, i.e. they do not synchronize in any way with the receiver. Furthermore, the italicized text reflects the transmitter ability to control the frequency and time of transmission according to a **predetermined frequency-time pattern** and at the same time, the transmitter uses encryption for the transmitted information so that even if the transmission is intercepted, the meaning of the transmitted massage is not clear to the eves-dropper. Furthermore, **the encryption varies (it is not constant).** e.g. encryption key or algorithm, etc. varies with consecutive messages. This

further makes it more difficult for the eves-dropper to break the encryption or to develop a spoofing method. According to the present invention, in order to facilitate the synchronization between the receiver and the transmitter in varying the encryption, the implicit synchronization is used based on the frequency-time pattern used for the control of the transmission time and frequency. Thus, the receiver tracking the transmitter frequency and time of the transmissions (i.e. the receiver tracks the frequency-time sequence) anticipates the transmission frequency and time and can infer the current encryption key or algorithm without additional mechanism or transmission overhead that may otherwise be necessary for this purpose. This is particularly valuable in a one-way system, in which exchanging encryption synchronization information is not possible because of lack of the reverse link and because simple transmitting wirelessly such information from the transmitter to the receiver may be unreliable.

The applicant respectfully submits that none of these is anticipated in any way by Adair or Kent alone or in combination nor is obvious in the light of Adair and Kent alone or in combination.

In respect to the first reference, the applicant respectfully submits that Adair alone or in any combination with Kent does not teach or suggest in any way or make obvious in any way what the present application teaches and what claim 15 claims.

First, Adair teaches a system with plurality of transmitters designed with an intention to mitigate problem of collisions, which may occur if two or more transmitters transmit at the same time and at the same frequency. Adair transmitter design makes use of changing frequency according to a random number sequence. However, in Adair transmitter the actual sequence used for controlling the frequency **is not predetermined**.

Adair teaches:

> The apparatus [i.e. transmitter] includes a memory containing a plurality of memory locations each containing a random number. A first counter produces a series of frequency pointers with each frequency pointer identifying one of the memory locations. An integrated memory controller is connected to receive the frequency pointers and from the first counter and retrieves random numbers from the locations identified by the frequency pointer. In response to the retrieved random numbers, the controller produces data sequences which are input to a digital control input of a voltage supply. The voltage supply produces voltages corresponding to the data sequences retrieved at the digital control input. A voltage controlled oscillator retrieves the supply voltage and produces radio frequency signals at frequencies corresponding to the supply voltages. [col. 2 lines 39-53]
>
> To maintain the radiowave signals within maximum an minimum frequency limits, the apparatus further includes a limit memory containing limiting data corresponding to maximum

> an minimum frequency. The memory controller is connected to retrieve the limiting data and to prevent the voltage generator from producing supply voltages corresponding to frequencies greater than the maximum frequency or smaller than the minimum frequency. [col. 2 line 65 to col. 3 line 5]
>
> While the output frequency fout of each of the transmitters 46, 48, 50 may be varied, the frequency range over which the transmitters may transmit is limited between maximum frequency fmax and minimum frequency fmin. The maximum fmax frequency and the minimum frequency fmin may be established by operational parameters of the receiver 58 or by governmental regulation. The **transmitters 46, 48, 50 must therefore limit their respective output frequencies fout to the allowed frequency range**. [col. 4 lines 55-63]
>
> In addition to varying from unit to unit, the **data sequences corresponding to the minimum and maximum frequencies fmin, fmax vary according to temperature**, as determined by the temperature-dependent electrical characteristics of the components. [col. 6, lines 21-24]
>
> (**emphasis** added)

Thus, in Adair invention, the **frequency sequence used by a transmitter is temperature dependent.**

Adair describes producing the frequency sequences in great details on several columns (4, 5, 6, 7, 8, 9, and 10). For example, in conjunction with FIG. 3, Adair illustrates this point clearly by showing that there are several different limit values that are used according to the temperature.

Further, In Figure 5 and associated description Adair teaches steps of producing the frequency sequence. Accordingly the produced sequence depends on the frequency limits, which depend on the current temperature. For example, Adair teaches:

> In step 510, after the controller 72 has retrieved the 6-bit random number, the controller 72 compares the random number to the 6-bit data sequences retrieved from the fine adjust table 84 in step 506. If, in step 512, the random number is within the limits specified by the data retrieved in step 506, the controller 72 provides the 6-bit random number to the voltage generator 70 in step 514...[col. 8 lines 57-63]
>
> ...if the random number not within the limits, the controller 72 returns to step 508, where it retrieves another random number from the random number table 109. [col. 9 lines 15-18]
>
> (*emphasis added*)

Thus, it should be clear that Adair transmitter transmits at frequencies changed according to a sequence that is **not predetermined**. Note that this is in spite of the fact that the random numbers stored in the memory used for producing the sequence are predetermined (and not changing).

This means that regardless how the random numbers were generated in the first place, the frequency sequence is not predetermined..

Second, in Adair transmitter, the frequency-time sequence is also dependent on the temperature and can not be anticipated by the receiver.

Adair teaches:

> In a method of transmitting operational data produced by a monitoring station from the monitoring station to a remotely located receiver, a plurality of random numbers are generated and stored in respective locations in a random number memory. A first pointer is produced to identify a first of the locations and a second pointer is produced to identify a second of the locations. A data sequence is retrieved from the location identified by the first pointer and a control voltage corresponding to the retrieved data sequence is generated in response to the data sequence. A data sequence is also retrieved form the location identified by the second pointer and a transmission interval is determined in response to the data sequence retrieved form the location identified by the second pointer. A transmitter generates a carrier signal having a frequency corresponding to the control voltage an the operational data is combined with the carrier signal to produce a radiowave signal which is then transmitted after the transmission interval. [col. 3, lines 18-37]
>
> As can be seen in FIG. 6, the time pointer and frequency pointer do not necessarily remain equal, though they are initialized to the same value. Instead, the two pointers are allowed to drift apart. The drift between the frequency pointer and the time pointer occurs when the random number selected in step 508 is determined in step 512 to be outside of the allowed range. Then the random number designated by the frequency pointer is rejected, the frequency pointer is incremented, and a new random number is retrieved. **Thus the frequency pointer may be increased at times when the time pointer is not, such that the frequency and time pointers drift apart.** [col. 10, lines 9-20]
>
> (emphasis added)

Thus, it should be clear that in Adair system, the receiver can not anticipate the temperature-dependent frequency-time sequence produced by the transmitter because the frequency-time sequence changes unpredictably depending on the temperature. Thus, the transmitter design and operation as taught by Adair would be quite unsuitable for providing the variable encryption according to the present invention. Consequently, the applicant respectfully submits that the present invention as described and claimed is not only non-obvious in the light of Adair, but that Adair invention is quite unsuitable for providing the benefits of the present invention even if the present disclosure is made available. Neither the benefits of the present invention nor implementation is in any way obvious in the light of Adair. Further, in the light of the above argument, the applicant respectfully submits that Adair, actually, elaborately teaches away from the present invention.

In the light of the above arguments, it should already be crystal clear that Adair invention is fundamentally different and in no way makes the present invention obvious. However, further arguments can be made as follows.

In respect to the second reference, the Office states, in entirety:

> Kent discusses in the Description of Related Art in a US Patent that encryption and decryption typically involve the use of a sequence generator to provide a random or pseudo-random sequence of data bits which are used to control frequency hoping, spread spectrum or other security scheme of the system.
>
> (*emphasis added*)

In the cited reference, Kent in general merely teaches a way to seed ("randomize") a pseudo-random generator operating at fast clock, where the data for seeding is produced by a slow random number generator. This hardly adds anything to Adair invention. Adair already has memory filled with random numbers, and it does not matter how the numbers were generated as discussed above. Thus, Kent's invention does not help.

In a passing remark, Kent says:

> The output sequence is used for encrypt/decrypt data in a transmitter/receiver or used for to control the frequency hopping, spectrum spreading or other security scheme thereof. [col. 1, lines 42-45]

The applicant respectfully submits, that merely mentioning that the a pseudo-random generator output can be used for frequency hopping or encryption is very far from making obvious what the present invention teaches and what claim 15 claims.

The applicant respectfully submits that combining Adair invention with Kent does not change fundamentally Adair invention and does not make in any way the present invention obvious. In particular, the following arguments apply:

Third, in particular the issue of varying the encryption (for example varying the encryption key or varying the encryption algorithm) is not present in any of the cited references. Neither could it be inferred from the teaching in any of the references alone or in combination. Neither the benefits nor the implementation of the transmitter as taught and claim is obvious in the light of Adair combined with Kent.

Fourth, changing the encryption in such manner that the changes are affected by (and synchronized with) the frequency-time hopping are not present in any form in any of the cited reference.

Neither could this be inferred from the teaching in any of the references alone or in combination. Neither the benefits nor the implementation is obvious in the light of Adair combined with Kent. What is more, the elaborate teaching of Adair teaches away from the present invention by focusing almost the entire specification on describing how to affect the frequency of the transmitter in a manner that incompatible with the present invention.

Thus, the applicant respectfully submits that neither Adair alone nor in combination with Kent teach or suggest in any way, or make obvious in any way what the present invention teaches and what claim 15 claims.

The applicant respectfully submits that, in the light of the above arguments, the Office rejection based on 35 U.S.C. 103(a) is traversed and that claim 15 is allowable. Because claims 16 to 17 depend on claim 15, they are too allowable.

Claim 18 recites:

> 18. (previously presented) A frequency hopping telemetry transmitter comprising:
>
> circuit for transmitting transmissions intermittently, at time intervals and at various frequencies, independently of any receiver of said transmissions, and
>
> logic for providing a ***predetermined frequency-time pattern*** for controlling transmission frequency and time between transmissions, and
>
> wherein said ***transmitter is for modification of at least a portion of known data for transmission using a modifier that is varied based, at least in part, on said frequency-time pattern***.
>
> *(emphasis added)*

The arguments presented in respect to claim 15 apply.

In addition, the following argument can be made in respect to claim 18.

In respect to claim 18 the Office states, in entirety:

> Regarding claim18, claim 18 is rejected on the same grounds as for claim 15 because of similar scope. Furthermore, in column 3, lines 15-42, a plurality of random numbers are generated and stored in respective locations in a random number memory. The output frequency and interval hopping are generated by the stored random numbers. In view of that, the means for generating the plurality of random numbers as thought in Adair, Jr. performs equivalent function of the claimed modifier.
>
> *(emphasis added)*

The applicant respectfully points out that the Office is factually incorrect. In fact , Adair **random numbers do not perform an equivalent function**. In Adair transmitter, the data for transmission is not modified by the random numbers at all; only the frequency and time intervals are. The applicant respectfully submits that it is not the same to have random numbers and to apply them in a manner taught and claims by the present invention. Neither is it obvious what the benefits are and how to use such numbers to obtain such benefits.

Further, varying the modifier in a manner that the changes are affected by and synchronized with the frequency-time hopping are not present in any form in any of the cited reference. Neither could this be inferred from the teaching in any of the references alone or in combination. Neither the benefits nor the implementation is obvious in the light of Adair combined with Kent.

Thus, the applicant respectfully submits that neither Adair alone nor in combination with Kent teach or suggest in any way, or make obvious in any way what the present invention teaches and what claim 18 claims.

The applicant respectfully submits that, in the light of the above arguments, the Office rejection based on 35 U.S.C. 103(a) is traversed and that claim 18 is allowable. Because claims 19 to 20 depend on claim 18, they are too allowable.

Additional Remarks

The Applicant wishes to inform the Office about a newly issued patent to the applicant

Patent number : 6,925,105 issued August 2, 2005.

Request for Reconsideration Pursuant to 37 C.F.R. 1.111

Having responded to each and every ground for objection and rejection in the Office action mailed March 9, 2005, applicant requests reconsideration of the application pursuant to 37 CFR 1.111 and request that the Examiner allow the pending claims 15-20 in addition to the already allowed and pending claims 1-14 and pass the application to issue.

Applicant respectfully submits that claims 1-20 are allowable and requests that the Examiner pass the application to issue.

Respectfully,

By _____
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Date: August 8, 2005
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